ECG ELECTRODE CONNECTOR

BACKGROUND

1. Technical Field

The present disclosure relates to biomedical electrodes, and in particular, to a radiolucent biomedical electrode connector and radiolucent lead wires for performing biomedical monitoring of a patent during imaging procedures.

2. Background of Related Art

Electrocardiograph (ECG) monitors are widely used to obtain medical (i.e. biopotential) signals containing information indicative of the electrical activity associated with the heart and pulmonary system. To obtain medical signals, ECG electrodes are applied to the skin of a patient in various locations. The electrodes, after being positioned on the patient, connect to an ECG monitor by a set of ECG lead wires. The distal end of the ECG lead wire, or portion closest to the patient, may include a connector which is adapted to operably connect to the electrode to receive medical signals from the body. The proximal end of the ECG lead set is operably coupled to the ECG monitor and supplies the medical signals received from the body to the ECG monitor.

A typical ECG electrode assembly may include an electrically conductive layer and a backing layer, the assembly having a patient contact side and a connector side. The contact side of the electrode pad may include biocompatible conductive gel or adhesive for affixing the electrode to a patient's body for facilitating an appropriate electrical connection between a patient's body and the electrode assembly. The connector side of the pad may incorporate a metallic press stud having a bulbous profile for coupling the electrode pad to the ECG lead wire. In use, the clinician removes a protective covering from the electrode side to expose the gel or adhesive, affixes the electrode pad to the patient's body, and attaches the appropriate ECG lead wire connector to the press stud by pressing or "snapping" the lead wire connector onto the bulbous press stud to achieve mechanical and electrical coupling of the electrode and lead wire. Alternatively, ECG connectors that engage via manipulation of a lever or other mechanical locking device may be employed. After use, a clinician then removes the ECG lead wire connector from the pad by pulling or "unsnapping" the connector from the pad or by releasing the lever or other locking mechanism.

Placement of the electrodes on a patient has been established by medical protocols. A common protocol requires the placement of the electrodes in a 5-lead configuration: one electrode adjacent each clavicle bone on the upper chest and a third electrode adjacent the patient's lower left abdomen, a fourth electrode adjacent the sternum, and a fifth electrode on the patient's lower right abdomen.

During certain procedures it may be necessary to monitor biological (e.g., ECG) parameters of a patient that is undergoing imaging, such as CT-scan or MRI. Use of conventional ECG connectors and lead wire sets typically associated therewith may have drawbacks in these applications, since they tend to interfere with the imaging systems. In one example, certain components of the ECG connectors and/or lead wires may be detected by the imaging apparatus and consequently may obfuscate the visual images upon which clinicians and surgeons rely. In another example, ferrous and/or magnetic components commonly found in ECG connectors, such as in springs and clips, may be potentially hazardous when used within the intense magnetic field of an MRI scanner.

SUMMARY

In an embodiment in accordance with the present disclosure, there is provided an ECG connector assembly, comprising a housing having an interior recessed surface. The interior recessed surface has disposed therein an opening dimensioned to operably receive the press stud of an ECG electrode pad. A radiolucent conductor is disposed on at least a portion of the interior recessed surface, and a radiolucent lead wire conductor extends from a proximal end of the housing and is operably coupled to the radiolucent conductor. The ECG connector assembly includes an engagement member pivotably disposed upon the interior recessed surface and having an engaging face and a pivot. The engagement member is pivotable between a first position whereby the engaging face is closer to a top portion of the opening and a second position whereby engaging face is further from a top portion of the opening. A radiolucent resilient member disposed within the housing is configured to bias the engagement member towards the first position.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are not intended to be drawn to scales. In the drawing, each identical or nearly identical component that is illustrated in various figures is represented by a like numeral. For purposes of clarity, not every component may be labeled in every drawing. Various embodiments of the present disclosure are described hereinbelow with references to the drawings, wherein:

FIG. **1** is an exploded view of a conventional ECG electrode connector;

FIG. **2** is a schematic diagram of the conventional ECG electrode connector of FIG. **12**A;

FIG. **3**A is a view of an embodiment of a radiolucent ECG electrode connector in an engaged configuration in accordance with the present disclosure;

FIG. **3**B is a view of the FIG. **3**A embodiment in a disengaged configuration in accordance with the present disclosure;

FIG. **3**C is a detail view of a press stud opening of the FIG. **3**A embodiment of a radiolucent ECG electrode connector in accordance with the present disclosure

FIG. **4**A is a view of another embodiment of a radiolucent ECG electrode connector in an engaged configuration in accordance with the present disclosure;

FIG. **4**B is a view of the FIG. **4**A embodiment in a disengaged configuration in accordance with the present disclosure; and

FIG. **5** is a view of another embodiment of a radiolucent ECG electrode connector in accordance with the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

This invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including," "comprising," "having," "continuing," or "involving" and variations thereof herein, is meant to encompass the items listed thereafter and equivalents thereof as well as additional items.

Particular embodiments of the present disclosure are described hereinbelow with reference to the accompanying drawings; however, the disclosed embodiments are merely examples of the disclosure, which may be embodied in various forms. Well-known functions or constructions and repeti-